GOES-R Series
Level I Requirements Document

Presentation to NOAA Observing Systems Council (NOSC)

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Purpose

- To request NOSC recommendation for approval by PMC Chair of the GOES R Series Level 1 Requirements Document

Level I Requirements Document

- Documents Top-level Mission requirements approved by NOAA/DOC
- Used to assess the success of the mission
- Serves as a contract between the acquiring agency (DOC/NOAA) and the System Program Director (e.g, GOES-R) for delivery of the system

- Content:
  - Identification of top-level data requirements
  - Priority of data requirements
  - Identification of instruments required to meet requirements
  - Life Cycle Costs
  - Launch readiness dates
  - Mission Success Criteria

Activities

- September 20, 2006 NOSC meeting
  - NOSC staff presented overview of draft GOES R Series Level I, Final Document – scope, format, content
  - NOSC requested review of Level I, Final_Draft v0.3 upon completion of GORWG review

- September 26 - October 9, 2006
  - GORWG Member Comments Received
  - GORWG Comment Disposition, additional RPSI and GOES-R Program Office (GPO) comments provided
  - GORWG/RPSI/GPO incorporated into Level I, Final_Draft v0.4
  - GORWG/RPSI/GPO Comment Disposition into V0.5

- October 10, 2006 - Version 0.5 provided to NOSC members for review and comments by October 17, 2006

Activities

- RPSI consolidated comments and generated GOES R/S Level 1, *Final_Draft* v0.6 on October 24
- NOSC provided updated tier prioritization based on final performance capabilities.
- GOES Program Office became document custodian for Level 1 in November
- GORWG has:
  - Provided review and comment
- GPO has:
  - Updated final instrumentation and high level performance (post PDRR)
  - Incorporated updated GORWG prioritization
  - Consolidated and incorporated comments
  - Incorporated cost and schedule sections

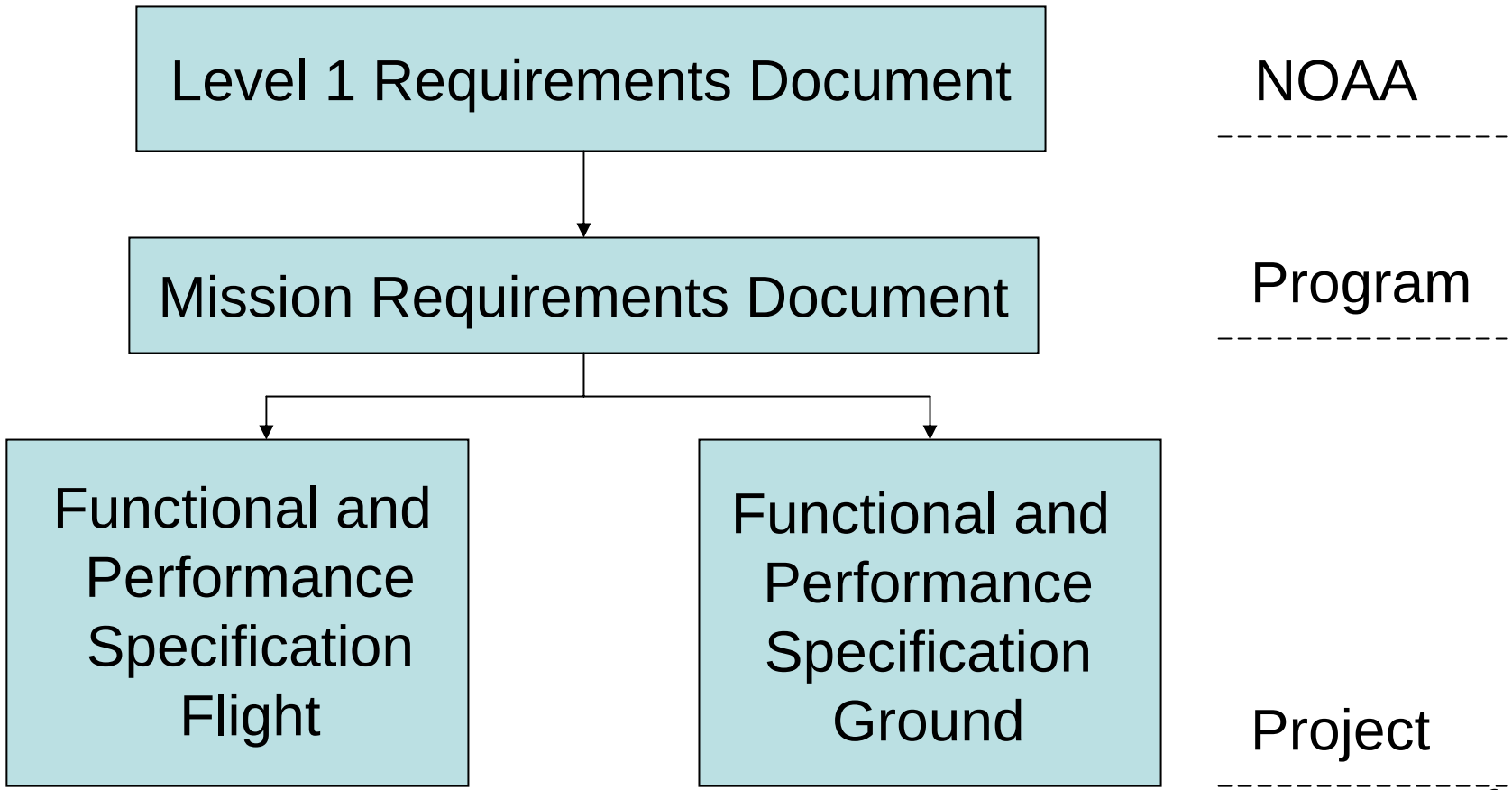
Process

- Program Definition Risk Reduction (PDRR) process utilized for:
  - development of a GOES-R Systems Concept
  - assessment of GPRD requirements against technical, cost, and schedule constraints
- GORWG provided user representation during PDRR process and during development of Level 1 requirements

Process

- GOES-R Level 1 Requirements Document is ready for approval for and serves as the top level document for the Acquisition and Operations phase
- System Design will be assessed against Level 1 at completion of System Level Preliminary Design Review

Requirements Flowdown



Changes from NOSC Reviewed Version 6

Products

- Elimination of coastal waters imagery (CWI) capability
- Legacy Sounder “equivalent” products vs. sounding products
  - Elimination of sounder
  - Analysis of Alternatives performed by Office of Systems Development to continue studies toward CWI and advanced sounding capability.
- Better reflects requirement for improved product delivery performance over GOES NOP

Systems Engineering

- Translated to requirements language
  - Removed configuration management information
  - Replaced guidance language with “shall” statements

Systems Engineering

- Product Tables added
  - GOES-R is a product driven mission
  - Tables identify primary instrument, priority tier and spatial coverage
  - Allows for clear decomposition to mission and instrument performance requirements

Programmatic

- Addition of threshold for budget and schedule control
  - Sets programmatic performance requirements in addition to technical
- Availability requirements vs number of satellites
  - Shifts to a system rather than implementation requirement - providing weather data vs how many satellites are flying

Programmatic

- Globally replaced GOES R/S with GOES-R Series
  - Provides flexibility for the program to demonstrate, via formulation process, a program architecture driven by product and availability requirements

Summary

- This document is the result of a collaborative effort between GOES-R Program Office and the GOES-R Operational Requirements Working Group
- It represents NOAA program requirements in a clear,concise manner and is ready for program execution.

Recommended Next Steps

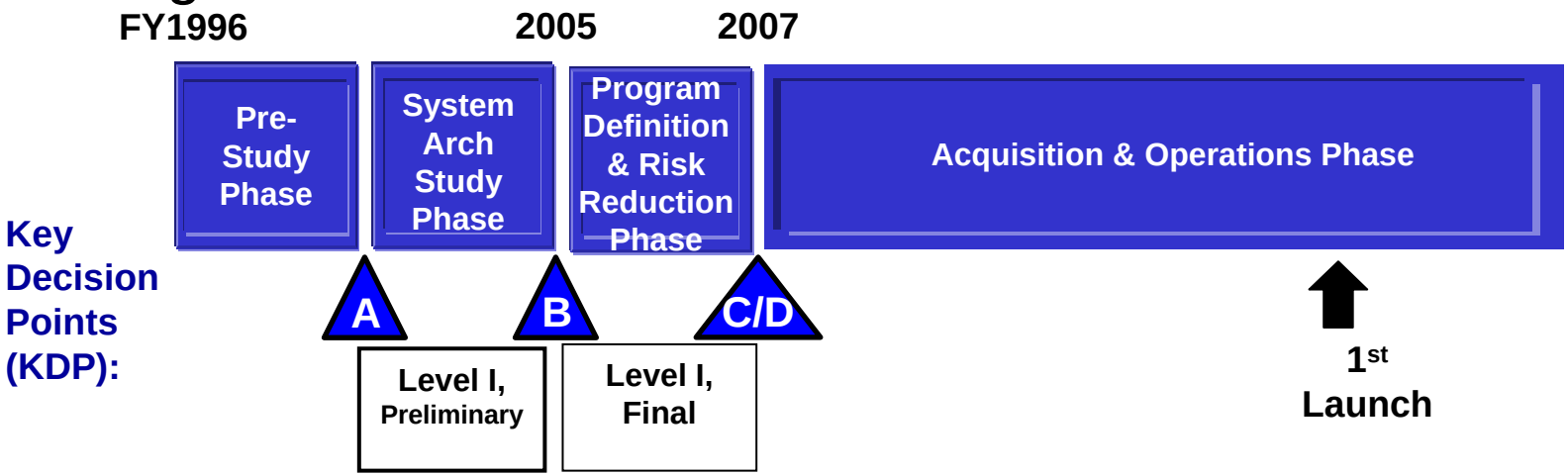
- NOSC to provide a recommendation memo for the PMC by April 17

- Prior to KDP C/D, GPO will**:**
  - Conduct all reviews and obtain all concurrences needed for DUS approval
  - Obtain DUS approval

BACK-UP CHARTS

Level I Requirements Document
Schedule

System Acquisition schedule shows *Preliminary* and *Final* versions of Level I documentation are generated



Observational Requirements Summary

- Tier IA
  - Cloud and Moisture Imagery via ABI

Observational Requirements Summary

- Tier IB
  - Aerosol Detection (including Smoke and Dust) via ABI
  - Suspended Matter/Optical Depth via ABI
  - Volcanic Ash: Detection and Height via ABI
  - Cloud Top Height via ABI
  - Cloud Top Pressure via ABI
  - Cloud Top Temperature via ABI
  - Lightning Detection via GLM
  - Legacy Vertical Moisture Profile via ABI
  - Legacy Vertical Temperature Profile via ABI
  - Derived Stability Indices via ABI
  - Total Precipitable Water via ABI
  - Radiances via ABI
  - Sea Surface Temperature via ABI

Observational Requirements Summary

- Tier II
  - Cloud Imagery: Coastal via ABI
  - Cloud Liquid Water via ABI
  - Enhanced “V”/Overshooting Top Detection ABI via ABI
  - Hurricane Intensity via ABI
  - Low Cloud and Fog via ABI
  - Rainfall Rate/QPE via ABI
  - Total Water Content via ABI
  - Clear Sky Masks via ABI
  - Absorbed Shortwave Radiation: Surface via ABI
  - Downward Longwave Radiation: Surface via ABI
  - Downward Solar Insolation: Surface via ABI
  - Reflected Solar Insolation: TOA via ABI

Observational Requirements Summary

- Tier II
  - Upward Longwave Radiation: Surface via ABI
  - Upward Longwave Radiation: TOA via ABI
  - Derived Motion Winds via ABI
  - Fire/Hot Spot Characterization via ABI
  - Snow Cover via ABI
  - Energetic Heavy Ions via SEISS
  - Magnetospheric Electrons and Protons: Low Energy via SEISS II
  - Magnetospheric Electrons and Protons: Medium and High Energy via SEISS
  - Solar and Galactic Protons via SEISS II
  - Geomagnetic Field via Magnetometer
  - Solar Flux: EUV via EXIS
  - Solar Flux: X-Ray via EXIS
  - Solar Imagery: X-Ray via SUVI

Original GOES R Plan

Requirements Prioritization – Nov 05

Tier IA - KPPs

Imagery: Cloud
Imagery: Water Vapor

Tier IB

Atmospheric Radiances: IR & Vis
Atmospheric Water Vapor: Profiles
Cloud Base Height
Cloud Layers
Lightning Detection
Solar Flux: X-Ray
Atmospheric Temperature: Profiles
Cloud Top Height
Cloud Top Temperature/Pressure
Aerosol Detection
Solar and Galactic Protons
Solar Imagery: X-Ray/Radiance

Tier II

Sea Surface Temperature
Solar Insolation: Surface
Energetic Heavy Ions
Solar Flux: EUV
Protons: Med & High Energy
Cloud Liquid/Ice Water Path
Surface Albedo
Ocean Color / Optical Properties
Longwave Radiation: Surface & TOA
Total Water Content
Geomagnetic Field, GEO
Turbulence
Vegetation Index
Solar Irradiance
Snow Cover
Electrons: Med & High Energy
Suspended Matter
Electrons & Protons: Low Ergy
Fire Characterization
Solar Imagery: X-Ray/Temp
Visibility/Fog

Tier III

CO Concentration
Sea & Lake Ice Characteristics
Land Surface (Skin) Temperature
Ozone: Profiles
Ocean Currents
Cloud Phase
Cloud Droplet Concentration
Flood/Standing Water
Sea & Lake Ice: Surface Temp
Ocean Turbidity
Cloud Type
SO2 Detection
Cloud Particle Size Distribution
Aerosol Particle Size
Sea & Lake Ice: Thickness
Cloud Optical Depth
Ozone Total